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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of:

Attorney Docket No.: 3242.01US02

Gibson

Confirmation No.: 1145

Application No.: 10/673,641

Examiner: Melody M. Burch

Filed: September 26, 2003

Group Art Unit: 3683

For: S CAM BUSHING ASSEMBLY

SECOND AMENDED APPEAL BRIEF UNDER 37 C.F.R. § 41.37

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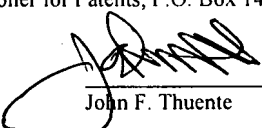
The Appeal Brief is presented in response to the Notice of Non-Complaint Appeal Brief of March 21, 2007. The Appeal Brief is further presented in support of the Notice of Appeal to the Board of Patent Appeals and Interferences, filed June 22, 2006, from the final rejection claims 1, 4, 6-15, 18-28, 31, and 33-45, as set forth in the Final Office Action of March 22, 2006.

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John F. Thuent

I. REAL PARTY IN INTEREST (37 C.F.R. § 41.37(c)(1)(i)).

The real party in interest is the assignee, W.C. Industries, Inc.

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 41.37(c)(1)(ii)).

Appellant and Appellant's legal representatives know of no other appeals or interferences that may be related to, directly affect or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS (37 C.F.R. § 41.37(c)(1)(iii)).

Claims 1, 4, 6-15, 18-28, 31, and 33-45 stand rejected, remain pending, and are the subject of the present Appeal.

Claims 2-3, 5, 16-17, 29-30, and 32 have been cancelled.

IV. STATUS OF AMENDMENTS (37 C.F.R. § 41.37(c)(1)(iv)).

All amendments have been entered. No amendments have been filed subsequent to the Final Office Action of March 22, 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. § 41.37(c)(1)(v)).

To aid in the Board's consideration of the present Appeal, a concise explanation of the subject matter defined in claims 1, 15, and 28 is set forth below, referring to the specification by page and line number and to the drawing by reference characters. The concise explanation does not provide an exhaustive or exclusive view of the subject matter defined in the claims.

A. CLAIM 1

A support assembly for supporting a S cam. The S cam (12) generally includes an elongate metal shank (16) having an S-head (14) and splines (18). See Application, for example, at page 3, line - page 4, line 4; see also Figs. 1 and 3. Rotation of the S cam (12) causes an arm of the S-head to act on a brake shoe (11) to frictionally engage with a brake drum (15). Id. The support assembly generally includes a single elongate bushing (40) rotationally supporting and substantially coextensive along the length of the shank (16), the bushing (40) extending from proximate the S-head (14) to proximate the splines (18). See Application, for example, at page 4, lines 11-18; see also Figs. 1 and 3. The support assembly further includes a bushing holder (42), wherein the bushing (40) is substantially enclosed within the bushing holder (42). See Application, for example, at page 2, lines 10-19, page 4, line 9 - page 5, line 2; see also Figs. 1 and 3.

B. CLAIM 15

A support assembly for supporting a S cam. The S cam (12) generally includes an elongate metal rod shank (16) having an S-head (14) and splines (18). See Application, for example, at page 3, line - page 4, line 4; see also Figs. 1 and 3. The support assembly generally includes a single elongate bushing (40) rotationally supporting and substantially coextensive along the length of the shank (16), the bushing (40) extending from proximate the S-head (14) to proximate the splines (18). See Application, for example, at page 4, lines 11-18; see also Figs. 1 and 3. The support assembly further includes a bushing holder (42), wherein the bushing (40) is substantially enclosed within the bushing holder (42). See Application, for example, at page 2, lines 10-19, page 4, line 9 - page 5, line 2; see also Figs. 1 and 3.

C. CLAIM 28

A method of supporting a S cam. The S cam (12) generally includes an elongate metal rod shank (16) having an S-head (14) and splines (18). See Application, for example, at page 3, line - page 4, line 4; see also Figs. 1 and 3. The method comprises rotationally supporting the shank (16) in a single elongate bushing (40), such that the bushing (40) is substantially coextensive with the shank (16) and extends from proximate the S-head (14) to proximate the splines (18). See Application, for example, at page 4, lines 11-18; see also Figs. 1 and 3. The method also comprises providing a bushing holder (42) and substantially enclosing the bushing (40) within the bushing holder (42). See Application, for example, at page 2, lines 10-19, page 4, line 9 - page 5, line 2; see also Figs. 1 and 3.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL (37 C.F.R. § 41.37(c)(1)(vi)).

A. Whether claims 1, 4, 6, 11, 13, 15, 18, 19, 24, 28, 31, and 43-45 are unpatentable under 35 U.S.C. §103(a) over U.S. Patent No. 3,497,037 to Deibel ("Deibel").

B. Whether claims 1, 4, 6, 7, 15, 18-20, 28, 31, 33, 34, 39, 41, and 43-45 are unpatentable under 35 U.S.C. §103(a) over U.S. Patent No. 6,240,806 to Morris et al. ("Morris") in view of U.S. Patent No. 2,382,554 to Eksbergian et al. ("Eksbergian").

C. Whether claims 12, 14, 25-27, 40, and 42 are unpatentable under 35 U.S.C. §103(a) over Deibel in view of U.S. Patent No. 4,346,535 to Asano et al. ("Asano").

D. Whether claims 12, 14, 25-27, 40, and 42 are unpatentable under 35 U.S.C. §103(a) over Morris in view of Eksbergian and Asano.

E. Whether claims 8-10, 21-23, and 35-37 are unpatentable under 35 U.S.C. §103(a) over Morris in view of Eksbergian and further in view of U.S. Patent No. 6,450,073 to Boyer et al. ("Boyer").

VII. ARGUMENT (37 C.F.R. § 41.37(c)(1)(vii)).

A. REJECTION UNDER 35 U.S.C. § 103(a) OVER DEIBEL.

The Examiner rejected claims 1, 4, 6, 11, 13, 15, 18, 19, 24, 28, 31, and 43-45 under 35 U.S.C. § 103(a) as being unpatentable over Deibel. Appellant respectfully requests reversal of the rejection in view of the following comments.

"To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." MPEP 2142 (citing In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

With respect to independent claims 1, 15, and 28, Appellant asserts Deibel does not teach or suggest all of the claimed features. Prima facie obviousness is not established if all the elements of the rejected claim are not disclosed or suggested in the cited art. MPEP 2143.03. Specifically, Deibel fails to teach or suggest an elongate bushing wherein the bushing is **coextensive along the length of the shank and extends from proximate the S-head to proximate the splines**, as required by the claims.

The Examiner concedes that Deibel does not teach an elongate bushing. See Final Office Action of March 22, 2006, p. 2. The Examiner merely asserts that it would have been obvious to one of ordinary skill in the art to increase the length of the bearing in Deibel to be elongate. In doing so, however, the Examiner fails to provide any teaching or suggestion that the bearing length be increased to be coextensive along the length of the shank and to extend from proximate the S-head to proximate the splines. Id., p. 3.

The Examiner has given "coextensive" an unreasonably broad interpretation. Specifically, the Examiner interprets "coextensive" to include coinciding along the length of a shorter component (bearing) with respect to a longer component (camshaft) (in Deibel, a shorter bearing 145 with respect to a longer camshaft 128). As included in the claims, however, the bushing is coextensive along the length of the S cam shank. Deibel does not teach or suggest such a feature.

Without citing any source, the Examiner also incorrectly argues that "proximate" is a relative term and that the left end of the bushing is proximate the S-head compared to the splines and the other end of the bushing is proximate the splines compared to the S-head. See Final Office Action of March 22, 2006, p. 10. Using this definition, however, even an extremely thin, narrow bearing positioned anywhere between the S-head and splines might be proximate both the S-head and splines, despite the length and positioning of the bearing. As included in the claims, the bushing is coextensive with the shaft extending from proximate the S-head at one end to proximate the splines at the other end. Deibel does not teach or suggest such a feature.

Therefore, even if one skilled in the art would have known to increase the length of the Deibel bearing (which Appellant does not concede), the Examiner has failed to point to any teaching or suggestion for modifying the bearing in Deibel such that it is substantially coextensive along the length of the S cam shank and extends from proximate the S-head to proximate the splines. As such, Deibel does not teach or suggest all of the claimed features of claims 1, 15, and 28.

With respect to specific features noted by the Examiner in the claims depending from claims 1, 15, and 28, these issues are not commented on further here because they are presently moot given the above analysis, although Appellant does not acquiesce in the Examiner's position. See MPEP 2143.03 ("If an independent claim is nonobvious under 35

U.S.C. § 103, then any claim depending therefrom is nonobvious.") As such, Appellant respectfully requests reversal of the rejection of claims 1, 4, 6, 11, 13, 15, 18, 19, 24, 28, 31, and 43-45 as being unpatentable over Deibel.

B. REJECTION UNDER 35 U.S.C. § 103(a) OVER MORRIS IN VIEW OF EKSERGIAN.

The Examiner rejected claims 1, 4, 6, 7, 15, 18-20, 28, 31, 33, 34, 39, 41, and 43-45 under 35 U.S.C. § 103(a) as being unpatentable over Morris in view of Eksergian.¹ Appellant respectfully requests reversal of the rejection in view of the following comments.

First, the cited references, individually or in combination, do not teach or suggest all of the features of claims 1, 15, or 28. The Examiner argues that in view of the teachings of Eksergian, one skilled in the art would have modified the two, spaced-apart Morris bushings with a single elongated bushing. For the reasons discussed below, Appellant does not concede that there is motivation to combine the two, spaced-apart Morris bushings based on the teachings of Eksergian. However, even if there were such motivation, there is no teaching or suggestion of the length of the combined bushing or that combined bushing be substantially coextensive along the length of the S cam shank and extend from proximate the S-head to proximate the splines.

There is also no motivation to combine the disclosure of Morris with that of Eksergian to replace the Morris dual bushings with an elongate bushing extending from proximate the S-head to proximate the splines. The Examiner asserts that altering the bushing assembly of Morris with the teachings of Eksergian facilitates assembly by having fewer parts. However, any replacement of the Morris dual bushings with a bushing more than half the length of the cam shaft would require a substantial redesign of the Morris assembly, as noted below, thus negating any alleged motivation to combine the references. "If the proposed modification or

¹ The Examiner actually rejects claims 1, 3, 4, 6, 7, 15, 17-20, 28, 30, 31, 33, 34, 39, 41, and 43-45. However, claims 3, 17, and 30 were cancelled previously in the Amendment of December 30, 2005.

combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. MPEP 2143.01 (citing In re Ratti, 270 F.2d 810, 813 (CCPA 1959) ("[T]he 'suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.'").

Specifically, if the two Morris bushings were replaced by a single bushing extending more than half the length of the cam shaft, the lubricant fitting and corresponding opening would be blocked by the bushing (see, e.g., Morris, Fig. 4). Because the Morris bushings are press fit into the tubing, there is little, if any, effective space between the outer diameter of the bushings and the inner diameter of the tubing. Any lubricant introduced into the fitting would have nowhere to go. The grease reservoir formed between the shaft and tube and the two bushings in Morris would be eliminated by a bushing extending more than half the length of the cam shaft. Because the grease reservoir is an important part of Morris (see col. 6, lines 25-27, the reservoir "assist[s] in trapping and diluting any contaminants that may migrate past the seals."), a single elongate bushing could negate the effectiveness of the Morris tube.

Importantly, a bushing extending more than half the length of the cam shaft in the Morris assembly would also physically inhibit any lubricant from reaching the shaft. The Morris assembly would have to be substantially redesigned for lubricant to reach the shaft through the fitting. The fitting is used to introduce lubricant to lubricate the shaft. See col. 5, lines 53-56 ("A fitting 72 is mounted in an opening (not shown) formed in cam tube 54 to enable introduction of a lubricant such as heavy grease into the interior of the cam tube for lubricating cam shaft 52 and bushings 59, 60.") As such, the modification of the Morris bushings would change the principle of operation of Morris. Thus, the teachings of Morris and Eksergian are not sufficient to render the claims prima facie obvious.

With respect to specific features noted by the Examiner in the claims depending from claims 1, 15, and 28, these issues are not commented on further here because they are presently moot given the above analysis, although Appellant does not acquiesce in the Examiner's position. As such, Appellant respectfully requests reversal of the rejection of claims 1, 4, 6, 7, 15, 18-20, 28, 31, 33, 34, 39, 41, and 43-45 as being unpatentable over Morris in view of Eksbergian.

C. REJECTION UNDER 35 U.S.C. § 103(a) OVER DEIBEL IN VIEW OF ASANO.

The Examiner rejected claims 12, 14, 25-27, 40, and 42 under 35 U.S.C. § 103(a) as being unpatentable over Deibel in view of Asano. Appellant respectfully requests reversal of the rejection in view of the following comments.

As stated above, Deibel does not include all of the limitations of claims 1, 15, or 28. Therefore, Deibel also does not teach or suggest all of the limitations of claims 12 and 14, claims 25-27, or claims 40 and 42, each of which includes the limitations of claims 1, 15, and 28, respectively. Moreover, Asano does not teach or suggest an elongate bushing substantially coextensive along the length of the S cam shank, the bushing extending from proximate the S-head to proximate the splines. As such, Asano does not make up for the deficiencies of Deibel with respect to claims 1, 15, or 28.

Therefore, the Examiner has not established a prima facie case of obviousness of Appellant's claimed invention over Deibel in view of Asano. As such, because Deibel in view of Asano does not teach or suggest all of the limitations of claims 12, 14, 25-27, 40, and 42, Appellant respectfully requests reversal of the rejection of claims 12, 14, 25-27, 40, and 42 as being unpatentable over Deibel in view of Asano.

D. REJECTION UNDER 35 U.S.C. § 103(a) OVER MORRIS IN VIEW OF EKSERGIAN AND ASANO.

The Examiner rejected claims 12, 14, 25-27, 40, and 42 under 35 U.S.C. § 103(a) as being unpatentable over Morris in view of Eksergian and further in view of Asano. Appellant respectfully requests reversal of the rejection in view of the following comments.

As stated above, Morris in view of Eksergian does not include all of the limitations of claims 1, 15, or 28. Therefore, Morris in view of Eksergian also does not teach or suggest all of the limitations of claims 12 and 14, claims 25, 26, and 27, or claims 40 and 42, each of which includes the limitations of claim 1, 15, and 28, respectively. As stated, Asano does not teach or suggest an elongate bushing substantially coextensive along the length of the S cam shank, the bushing extending from proximate the S-head to proximate the splines. As such, Asano does not make up for the deficiencies of Morris in view of Eksergian with respect to claims 1, 15, or 28.

Therefore, because Morris in view of Eksergian and Asano does not teach or suggest all of the limitations of claims 12, 14, 25-27, 40, and 42, Appellant respectfully requests reversal of the rejection of the claims as being unpatentable over Morris in view of Eksergian and Asano.

E. REJECTION UNDER 35 U.S.C. § 103(a) OVER MORRIS IN VIEW OF EKSESGIAN AND BOYER.

The Examiner rejected claims 8-10, 21-23, and 35-37 under 35 U.S.C. § 103(a) as being unpatentable over Morris in view of Eksergian and further in view of Boyer. Appellant respectfully requests reconsideration of the rejection in view of the following comments.

As stated above, Morris in view of Eksergian does not include all of the limitations of claims 1, 15, or 28. Therefore, Morris in view of Eksergian also does not teach or suggest all of the limitations of claims 8-10, claims 21-23, or claims 35-37, each of which includes the limitations of claim 1, 15, and 29, respectively. Moreover, Boyer does not teach or suggest an elongate bushing substantially coextensive along the length of the S cam shank, the bushing extending from proximate the S-head to proximate the splines. As such, Boyer does

not make up for the deficiencies of Morris in view of Eksbergian with respect to claims 1, 15, or 28.

Because Morris in view of Eksbergian and Boyer does not teach or suggest all of the limitations of claims 8-10, 21-23, and 35-37, Appellant respectfully requests reversal of the rejection of claims 8-10, 21-23, and 35-37 as being unpatentable over Morris in view of Eksbergian and Boyer.

VIII. CLAIMS APPENDIX (37 C.F.R. § 41.37(c)(1)(viii)).

1. (Previously Presented) A support assembly for supporting a S cam, the S cam being an intermediary device between a brake actuator and a set of wheel brakes and is generally an elongate metal shank having an S-head at a first end of the shank and a set of splines at the second end of the shank, the S-head having at least one arm for engaging a respective brake shoe, whereby rotation of the S cam in a first direction causes the at least one arm of the S-head to act on the brake shoe to frictionally engage the respective brake shoe with a brake drum, the support assembly comprising:

a single elongate bushing rotationally supporting and substantially coextensive along the length of the S cam shank, the bushing extending from proximate the S-head to proximate the splines; and

a bushing holder, wherein the single elongate bushing is substantially enclosed within the bushing holder.

2-3. (Canceled)

4. (Previously Presented) The support assembly of claim 1, wherein the bushing is formed of a plastic material.

5. (Canceled)

6. (Previously Presented) The support assembly of claim 5, wherein an outside diameter of the bushing is sized to form a tight fit with an inside diameter of the bushing holder.

7. (Previously Presented) The support assembly of claim 1, wherein a bushing holder has at least one grease fitting disposed in a bore defined through a bushing holder body for transporting lubricant to the inside margin of the bushing holder.
8. (Previously Presented) The support assembly of claim 7, wherein the grease fitting intersects a circumferential groove defined in the bushing holder inside margin.
9. (Previously Presented) The support assembly of claim 8, wherein the circumferential groove intersects at least one spiral groove defined in the bushing holder inside margin.
10. (Previously Presented) The support assembly of claim 9, wherein the circumferential groove and the at least one spiral groove defined in the bushing holder inside diameter form a path for lubricating the interface defined between the bushing and the bushing holder.
11. (Previously Presented) The support assembly of claim 1, wherein the bushing is substantially sealed within a bushing holder by a first and second seal member disposed at first and second ends of the bushing respectively, each of the seal members forming a sealing interface with the bushing holder and the S cam shank.
12. (Previously Presented) The support assembly of claim 1, wherein a S cam shank outside margin is machined and has a certain outside diameter.
13. (Previously Presented) The support assembly of claim 12, wherein the S cam shank outside margin is spaced apart from an inside margin of the bushing.

14. (Previously Presented) The support assembly of claim 12, wherein the S cam shank outside margin is spaced apart from an inside margin of the bushing by an amount between .001 and .010 inches.

15. (Previously Presented) A support assembly for supporting a S cam, the S cam having a generally elongate metal rod shank having an S-head at one end of the shank and a set of splines at the other end of the shank, the support assembly comprising:

a single elongate bushing rotationally supporting and substantially coextensive along the length of the S cam shank, the bushing extending from proximate the S-head to proximate the splines; and

a bushing holder, the bushing being substantially enclosed within the bushing holder.

16-17. (Canceled)

18. (Previously Presented) The support assembly of claim 15, wherein the bushing is formed of a plastic material.

19. (Previously Presented) The support assembly of claim 15, wherein an outside diameter of the bushing is sized to form a tight fit with an inside diameter of the bushing holder.

20. (Previously Presented) The support assembly of claim 15, wherein the bushing holder has at least one grease fitting disposed in a bore defined through a bushing holder body for transporting lubricant to an inside margin of the bushing holder.

21. (Previously Presented) The support assembly of claim 20, wherein the grease fitting intersects a circumferential groove defined in the bushing holder inside margin.
22. (Previously Presented) The support assembly of claim 21, wherein the circumferential groove intersects at least one spiral groove defined in the bushing holder inside margin.
23. (Previously Presented) The support assembly of claim 22, wherein the circumferential groove and the at least one spiral groove defined in the bushing holder inside diameter form a path for lubricating the interface defined between the bushing and the bushing holder.
24. (Previously Presented) The support assembly of claim 15, wherein the bushing is substantially sealed within a bushing holder by first and second seal members disposed at first and second ends of the bushing respectively, each of the seal members forming a sealing interface with the bushing holder and the s cam shank.
25. (Previously Presented) The support assembly of claim 15, wherein a S cam shank outside margin is machined and has a certain outside diameter.
26. (Previously Presented) The support assembly of claim 25, wherein the S cam shank outside margin is spaced apart from an inside margin of the bushing.
27. (Previously Presented) The support assembly of claim 26, wherein the S cam shank outside margin is spaced apart from an inside margin of the bushing by an amount between .001 and .010 inches.

28. (Previously Presented) A method of supporting a S cam, the S cam being an intermediary device between a brake actuator and a set of wheel brakes and having a generally elongate metal shank having an S-head at one end and a set of splines at the other end, the S-head having at least one arm for engaging a respective brake shoe, whereby rotation of the S cam in a first direction causes the at least one arm of the S-head to act on the respective brake shoe to frictionally engage the brake shoe with a brake drum, the method comprising:

rotationally supporting the S cam shank in a single elongate bushing, such that the bushing is substantially coextensive with the S cam shank and extends from proximate the S-head to proximate the splines.; and

providing a bushing holder and substantially enclosing the bushing within the bushing holder.

29-30. (Canceled)

31. (Original) The method of claim 28, including forming the bushing of a plastic material.

32. (Canceled)

33. (Original) The method of claim 31, including sizing an outside diameter of the bushing to form a tight fit with an inside diameter of the bushing holder.

34. (Original) The method of claim 28, including disposing at least one grease fitting in a bore defined through a bushing holder body for transporting lubricant to the inside diameter of the bushing holder.
35. (Previously Presented) The method of claim 33, defining a circumferential groove in a bushing holder body inside margin and intersecting the grease fitting with the groove.
36. (Previously Presented) The method of claim 35, including forming at least one spiral groove in the bushing holder body inside margin in an intersecting relationship with the circumferential groove.
37. (Previously Presented) The method of claim 36, including forming a path for lubricating the interface defined between the bushing and the bushing holder body inside margin by means of the circumferential groove and the at least one spiral groove defined in the bushing holder body inside margin.
38. (Original) The method of claim 28, including substantially sealing the bushing within a bushing holder by first and second seal members disposed at first and second ends of the bushing respectively.
39. (Original) The method of claim 28, including forming a sealing interface with the bushing holder and the S cam shank.
40. (Previously Presented) The method of claim 28, including machining a S cam shank outside margin to define a certain outside diameter.

41. (Previously Presented) The method of claim 40, including spacing the S cam shank outside margin apart from an inside margin of the bushing.

42. (Previously Presented) The method of claim 41, including spacing the S cam shank outside margin apart from the inside margin of the bushing by an amount between .001 and .010 inches.

43. (Previously Presented) The support assembly of claim 1, wherein the bushing is unitary.

44. (Previously Presented) The support assembly of claim 15, wherein the bushing is unitary.

45. (Previously Presented) The method of claim 28, further comprising forming the bushing to be unitary.

IX. EVIDENCE APPENDIX (37 C.F.R. § 41.37(c)(1)(ix)).

None.

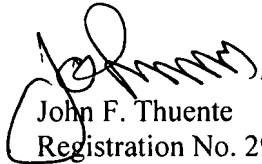
X. RELATED PROCEEDINGS APPENDIX (37 C.F.R. § 41.37(c)(1)(x)).

None.

XI. CONCLUSION.

Appellants submit that claims 1, 4, 6-15, 18-28, 31, and 33-45 are patentable over the references of record. Appellants assert that the Examiner has clearly failed to establish prima facie unpatentability of any of the claims. Thus, Appellant respectfully requests the reversal of the rejections of claims 1, 4, 6-15, 18-28, 31, and 33-45 and the allowance of all pending claims.

Respectfully submitted,


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